

# Risk as an Economic Factor

BY

JOHN HAYNES

A DISSERTATION

PRESENTED TO THE BOARD OF UNIVERSITY STUDIES OF THE JOHNS HOPKINS  
UNIVERSITY FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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## VITA.

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## RISK AS AN ECONOMIC FACTOR.

THE word risk has acquired no technical meaning in economics, but signifies here as elsewhere chance of damage or loss. The fortuitous element is the distinguishing characteristic of a risk. If there is any uncertainty whether or not the performance of a given act will produce a harmful result, the performance of that act is the assumption of a risk. It is obvious that risks may vary in the degree of danger which is present between absolute certainty of harm as one limit and almost absolute certainty of security as the other limit. If one were to jump from a precipice at a great height, he could not be said to take a risk. His destruction would be certain. On the other hand, it is doubtful whether there is any such thing as absolute certainty. Neither life nor possessions are ever removed from all possible peril. Even when it is certain that an unfavorable event will happen, a risk may exist, because the time of the occurrence is uncertain. Death is a certainty for all, but the time of death is among the greatest of uncertainties. Again, the fortuitous element may be one of degree. It may be certain that an injury will be wrought by a certain force or action, while it is uncertain how much injury will be done.

Mangoldt, who, so far as I know, is the only writer who has attempted to distinguish economic risks from other risks, says that a distinction must be made between mere irregularities (*Unregelmässigkeiten*) of results and economic risks.\* The champagne-maker, for instance, must reckon that a greater or less number of bottles will break. Very true; but, if there is an uncertainty how many will break, there is a risk, and why it should be excluded from economic risks I cannot see. There is no occasion for

\* *Die Lehre vom Unternehmerngewinn*, von Dr. H. von Mangoldt, p. 82.

any distinction between risks which are economic and those which are not. Every risk to a human being comes within the scope of economics.

Risk is universal. Life and happiness are perpetually hazarded. The dangers of death of supporter, fire, hail, earthquake, failure of crops, diseases of persons and stock, accidents to persons and property, bankruptcies, panics, deterioration and unprofitable sale of property, are, to a certain extent, unavoidable. Be as careful as we may, the very air we breathe may be freighted with disease germs. We abide in a perpetual state of risk. To escape from one peril is only to encounter another. There is, then, a certain minimum amount of risks which a person must bear. There is a class of risks of which we cannot say that they are "assumed."

The owner of wealth must, if he is rational, invest it in some productive enterprise, unless, under the circumstances, he decides to consume it; and, wherever it is invested, there will be some risk that part of it will be lost by the dishonesty of others, the deterioration in value of the property in which it is embodied, or in a change of value of the standard of deferred payment. If he thinks to escape by hoarding it in the shape of specie, robbery is to be feared, to say nothing of the opportunities of gain which are given up. If he decides to consume the wealth at once, he runs the risk of coming to poverty.

We may, however, assume that, by investing his money in government bonds or some other extremely safe security, he reduces the risk to which his property is subjected to a minimum. For taking this minimum of risk, he can obtain no compensation. So of the risks to life and health. The safest possible productive activity is carried on under circumstances of some danger, but the risk is no greater in some kinds of employment than would be the risk of not engaging in productive activities

at all. A workman could obtain no reward for incurring these risks. Neither he nor the capitalist can get compensation, from the fact that he is subject to those risks which are necessary and inseparable conditions, not only of all production, but of all human life and property. Nor could this minimum of risk hinder a man from investing his capital or devoting his labor to production, for to desist from such action would only bring upon him a more undesirable result.

By this is not meant that the harmful events, of which there is even a minimum of danger, do not affect production, nor that accidents do not modify the actual distribution of the products of industry, but that the risk does not do this. Harmful events are to be carefully distinguished from risks. It is true that the elimination of even the minimum of risk would be a great gain to society, because risk could not be eliminated without eliminating the injuries. It is seen, on careful analysis, that it is the elimination of the events, not of the risks of the events, that would be beneficial. We may then assume a theoretical minimum of risk to which all property and all life are at a given time subject. These risks we will denominate ineffective risks, because they can have no effect on production or distribution.

Above this margin there are all degrees of risk both to wealth and persons which we may designate as effective risks. Of these risks it can be correctly said that they are "assumed," and in a perfectly rational society they will be assumed only when some reward is expected and in general given for their assumption. In discussing risks as affecting distribution, it is this kind of risks, and this kind only, which will demand our consideration. Among ineffective risks are those which society, as a whole, must assume. The passage of a tariff bill will affect in some degree every person in our country, by adding to or subtracting from the general prosperity. So far, its passage

imposes an ineffective risk; but, if it especially endanger particular kinds of business, it enters in as one of the effective risks to which those businesses are subject. Professor H. C. Adams\* attributes the high profits made by manufacturers of certain lines of goods in the United States to the fact that the risk of tariff legislation prevents other capital from entering these lines of business.

All risks may be divided into static risks and dynamic risks. Static risks are those risks which would be found in a stationary state of society. Among them are those due to natural causes, such as damage by lightning, hail, earthquake, storms, disease, and many others. Risks arising from ignorance are a large class, which includes many fires, bankruptcies, sicknesses, accidents, early deaths, and failures in business from misdirected effort. Carelessness is closely akin to ignorance as a cause of damage. Lack of moral character gives rise to a class of risks known by insurance men as moral hazards. The most familiar example of this class of risks is the danger of incendiary fires. Dishonest failures, bad debts, etc. would fall in this class, as well as all forms of danger from the criminal classes. When these risks are spoken of as static, it is not meant that dynamic changes cannot modify them. Such is not the case. The invention of the electric light was a dynamic change which has modified the danger of damage by fire. Nevertheless, we may legitimately use the word "static," because, even in a stationary state of society, we should expect risks of the same essential kind. The amount of loss coming from static risks is incapable of calculation, but is certainly very great. The losses direct and indirect by fire alone are estimated by Mr. Edward Atkinson at \$250,000,000 for the United States in 1893.

Other risks may be called dynamic, because they are risks of damage which may be directly due to dynamic changes. These are chiefly of two kinds, the first

\* Lectures at Johns Hopkins University, 1894.

being changes in the wants of society. As civilization advances, human desires are subject to constant modification and to sudden changes in amount and direction. Changes of style which cannot be foreseen by producers are an example of changes in the wants of society. A stock of men's hats which is salable to-day will, perhaps, be utterly without a market next year. A dealer who has an over-stock is subject to heavy loss.

In the second place, changes in methods of production give rise to losses which may be subdivided into two classes. The first are the losses which fall upon those who are attempting to introduce new processes. "The uncertainties," says Professor Clark,\* "that attend the introduction of a new process are dynamic, since they would have no existence if industry were to continue in a stationary state. There is the chance that the process may be mechanically defective. It may not create the desired commodity as the projector of the enterprise expects. If, on the other hand, the dynamic change consists in offering some new commodity for the comfort and pleasure of consumers, the public may fail to give the expected welcome."

The second are losses which fall upon producers in consequence of the introduction of improved processes by others. There is constant danger that an innovation or an improvement of some kind will destroy the value of property in which a great amount of capital has been invested. Losses of this kind differ from those of which Professor Clark speaks, in that, while causing a loss to individuals, they bring a social gain. The wealth directed to the unsuccessful venture might have been employed in lines of static activity; but, by being diverted, it is lost, not only to its owner, but to society as well. In the second case, though society is a gainer by the improvement, individuals are large losers. Losses of this kind

\* *Quarterly Journal of Economics*, vol. vii. pp. 52, 53.

have been exceedingly common in recent years. A notable case was the destruction of capital incident to the opening of the Suez Canal. The ships, mainly sailing vessels, which went around the Cape of Good Hope and carried the products of India, were not adapted to the canal, and an amount of shipping estimated at two million tons was rendered practically valueless.\* Several years ago it was discovered that worsted goods soon became glossy, and that by an improved method this defect could be remedied. The Bradford manufacturers of worsted were unwilling to incur the great expense of changing their method. The French quickly made the change, and secured most of the market. The English made the change too late to save their trade. In this country a large manufactory made the change at once at a cost of three quarters of a million dollars.† It is clear that the total amount of dynamic losses must be very great.

We now come to the discussion of the relation of risk to production. President Andrews says,‡ “Not alone anarchy, but the slightest real insecurity to life or property, will paralyze production.” John Stuart Mill has dwelt at great length on security as a requisite of production. This is the equivalent of saying that insecurity or a condition where risks are numerous and great is unfavorable to production. Every risk diminishes by so much the prospective enjoyment of commodities to be produced. No man cares to labor for that from which he can get no benefit. This is a reason for the inefficiency of slave labor. So if there is a danger, especially a great danger, that the producer will sow where he cannot reap, he will refuse to sow at all. During the Middle Ages the great exactions of the feudal lords and of the Church were a most potent factor in discouraging industry. It

\* D. A. Wells, *Recent Economic Changes*, p. 30.

† *Bankers' Magazine*, vol. xxxviii. p. 831.

‡ *Institutes of Economics*, p. 54.

would not be scientific to class all of these exactions as risks. Many of them were certainties, but we are justified in saying that a risk exists whenever there is a chance that the harmful event in question may not happen. If in ninety-nine cases out of a hundred the harmful event occurs, it will probably entirely stop production; and thus the result will be the same as if it occurred in every case, but, theoretically, we may say a risk exists.

Risk is a deterrent to production, not only as acting upon the production of consumption goods, but it is a hindrance to the saving of capital. Indeed, this is perhaps the more important phase of the matter. Capital in many forms is difficult of protection. A consumption good usually has to be protected for but a short time, while a capital good must be protected for a long period. A man when he capitalizes or saves his funds looks forward to keeping them intact as a fund of pure productive force for a longer or shorter period, at least until he shall use them for consumption. He will measure the good to be accomplished by this fund of capital against the good of its present use. It is obvious, if he thinks there is danger, through monetary changes, overthrow of governments, or other great catastrophes, that his capital will be destroyed, he will be deterred from his intended saving. The greater the catastrophe feared, and the nearer the probable time of its occurrence, the more it will weigh with him as a deterrent influence.

Is risk always a deterrent to production? The writer is inclined to maintain that it is. Certain facts would seem to militate against this view. The most dangerous employments have no lack of hands. Railroads have no trouble in manning their trains with brakemen. Sailors are found in adequate numbers at low wages. Men are not few who seem to seek danger and court risk. The explanation of this phenomenon is to be found, not in the attractiveness of the risk itself, but in the attractiveness

of some condition or apparent condition which goes with the risk. It is an open question whether risk is ever taken for its own sake. It must, however, be admitted that risks are taken in great numbers by the majority of men with very little hesitation.

Professor Clark \* expresses his concurrence with Mangoldt in the opinion that the assumption of risks is to be considered productive, in a certain sense. "It yields," he says, "a net gain." This statement is not denied, but demands some further consideration. In what sense and with what limitations is it true? We have already seen that some risk is inseparable from human existence and activity. All production is accompanied by it. Risk-taking does not increase product in any such sense as labor and capital increase it. Indeed, we have seen that risk is a hindrance to production. Is there, then, any virtue in risk-taking? There is, and in this sense: that there is greater productivity where effective risks or risks which can be conceived of as avoidable are taken than there would be in a society where every man made it a point to subject himself to the minimum of risk. Risk-taking, then, has a kind of negative productivity. It is the *sine qua non* of any productivity above the minimum. It is desirable for society to have its members assume risks; and its members do assume risks for which, as we shall see, they must be paid. The credit system is considered by all competent economists as the means of immensely augmenting the productivity of society, but it also makes possible the immense losses and suffering which are incident to commercial crises. \*

It by no means follows that all enterprises involving risks are productive. The assumption of risks implies the occurrence of losses. Society cannot profit by the assumption of risks which entail an aggregate of losses above the

\* "Insurance and Business Profit," *Quarterly Journal of Economics*, vol. vii. p. 40.

aggregate of gains. Whether the taking of a particular risk will prove productive or not is of course determined only by the issue. Disregarding its effect on particular members of society, and assuming that society, as a whole, desires the largest possible aggregate product, it is desirable, when the probability of gain exceeds the probability of loss, that the risk should be taken. In estimating this probability, it is necessary to take into account not only the chance of gain or loss, but the value of the thing risked and the value of the thing which may be gained. If (to state an extreme case) there is one chance in nine hundred and ninety-nine that the investment of one dollar will produce one thousand, the taking of an infinite series of such risks would be productive. This has been said on the assumption that, if the venture is successful, society will be benefited. If so, the conclusion is easy that such risk-taking is in general to be approved. But, even from a social point of view, it would be undesirable that one should risk so much of his resources that he would be reduced to pauperism, or have his industrial or other social efficiency greatly impaired in case of the unfavorable outcome of his venture, though the probability of success were much greater than the probability of failure. This will more clearly appear in what will be said on the way in which risks are estimated. There is, however, a class of speculative risks which confer no special benefit. The gambler on the race track is the taker of risks which, if successful, transfer property from some other person to him. Such risk-taking is not productive unless the excitement incident to the gaming may be called a utility to that part of society which engages in such amusements. There are other cases of risk-taking of which society gets no benefit. The speculative buying of land to secure the unearned increment is an example. A writer in the *Bankers' Magazine* \* takes the ground

\* Vol. xliii. p. 259.

that certain great fortunes are justified because the men who have bought up mining and other lands had to take great risk in so doing; because, as he says, they had great "faith." This point, of course, has no weight unless it can be shown that society gets a benefit which could not otherwise have come to it. The point as made will hardly convince those economists who advocate the taking in some way by the public of the "unearned increment" of land.

President Andrews, correctly as the writer thinks, makes "risk, a hardship inseparable from the exercise of either labor or abstinence," one of the costs of production.\* And this is in some sense true, whatever meaning be given to that much discussed term, "cost." Cairnes counts among the costs of production † "the liability of producers to certain evils over and above the usual and calculable sacrifices incident to their work, which we may call risks." "The sacrifices of risk," he continues, "fall on both classes of producers alike, though the nature of the risk differs as it affects one or the other. Affecting the capitalist, it is a risk to his property; affecting the laborer, it is a risk to his bodily and mental faculties of life; but in either case it is an element of cost, being a real sacrifice incurred by a producer, and demanding a corresponding compensation in the value of the product." If we take the term "cost of production" in the sense of money cost of production or expense of production, that use of the word which we find in common life and which appears to me as comprehensive as any use of the word, there can, it would appear, be no question that risk is a cost of production. Marshall says ‡ that the money cost is made up of the sums of money which have been paid for "the exertions of all the different kinds of labor that are directly or indirectly involved in making

\* *Institutes of Economics*, p. 76.

† *Leading Principles*, p. 74.

‡ *Principles of Economics* (2d ed.), p. 399.

it, together with the abstinences or, rather, waitings required for saving the capital used in making it." All these efforts and sacrifices, he says, make the real cost of production. Unless risk is included, as it is by Cairnes,\* in the conceptions "labor" and "abstinence" or "waiting," it should be separately mentioned as among the costs of production. Payment for risk, nearly all economists agree, enters into gross interest. Risk raises the retail prices of commodities where goods are sold on credit. Every consumer has to pay more for his goods on account of the risk of loss on the book accounts to which the dealer is subject. Mr. James G. Cannon, of New York, estimates† from his experience that on the average the book accounts of retail grocers are worth 40 per cent. of their face value. It is true that some loss on the book accounts is practically a certainty, and the whole difference between the retail prices which a dealer could afford to charge, if doing business on a cash basis, and what he must charge when doing a credit business cannot be attributed to risk; but the additional charge which he makes to cover possible loss, in distinction from that loss which may be regarded as certain, can be attributed to that cause.

Turning now to the narrowest conception of cost with which I am acquainted, let us see whether risk can be brought under the concept. Professor Patten says:‡ "If we estimate the cost to society subjectively, it is the sum of the pains which producers must endure while engaged in production. . . . The cost of wheat is increased when more laborers must be employed in its production or when the labor of producing wheat becomes more irksome." Again, he defines § it as "disagreeable exer-

\* *Leading Principles*, p. 80.

† "Mercantile Book Accounts," *New York Independent*, November 16, 1893.

‡ *Dynamic Economics*, p. 50.

§ *Annals of the American Academy of Political and Social Science*, vol. iii. p. 410.

tion." If "pains" and "disagreeable" experiences are the ingredients of cost, then the hardship of subjecting one's self to risks for the sake of production must be counted as an element of cost. The laborer in a highly dangerous employment is likely to be under a nervous strain on account of his hazardous position. So far as this is true, he is suffering a cost in the strictest sense of the term. The capitalist who has placed his wealth in jeopardy may, and I have no doubt often does, have similar "unpleasant experiences." Even in a socialistic state many risks would remain costs to society. The pains incident to risking capital in production would be practically abolished, but the pains which individual laborers would have to endure while and because of subjecting themselves to risks would still have to be undergone.

Risk would be a cost even in the exceedingly peculiar sense in which the Austrian school use the word. Cost, according to Böhm-Bawerk,\* is nothing else than "the complex of those productive goods which have value,—the labor, concrete capital, uses of wealth, and so on which must be expended in the making of a product." Though not expressly mentioned, there is no reason why a list of "productive goods" which includes labor should not also include the assumption of risks.

Before entering upon the discussion of risk as affecting distribution, we will discuss the scope of insurance, and inquire what its economic definition is or ought to be. This is a subject on which there is great difference of opinion. Some writers, especially among the Germans, have attempted to give an economic definition of the word. Writers in English have, on the other hand, used the word without definition. We can glean from their use of it something of the significance that they attach

\* *Positive Theory of Capital* (Smart's translation), Book III. chap. x. p. 183.

to it. The word has been used by one set of writers in a narrow sense, which restricts its meaning to what is known by the business world as insurance, and by the others in a much more comprehensive way.

Emanuel Herrmann\* tries to reach the fundamental conception of insurance by an analysis of means of overcoming unfavorable circumstances (*ungünstige Umstände*) according to the degree of their perfection. These means he divides into three kinds:—

I. Avoiding (*Meidungen*); means for making the event insured against (*Versicherungs-Ereigniss*) entirely impossible or less likely. Lightning-rods are an instance.

II. Suppression (*Unterdrückungen*); preventing the increase of an injury, the growth of a partial loss to a total loss. Fire-extinguishers are an example.

III. Compensation, or insurance proper, which allows the injury to come in, but mitigates the results. Similar conceptions to that of Herrmann are held by Karl Knies, Schäffle, Reinhold Schlink, and Max Gebauer.† All these writers make insurance one of the means of resisting unfortunate circumstances, but disagree as to the exact limits of insurance proper.

Let us examine a few typical cases of the comprehensive use of the word. Edward About uses the following language:‡ “The ideal insurance will be that which prevents fire from destroying, tempests from wrecking ships. . . . That insurance, or rather terrestrial providence, is material progress, the victory of man over the elements. . . . All progress in nourishment, hygiene, and medicine, has for its object the insurance of man and animals from premature death. . . . But complete suppression can never be reached. It will always be necessary to found repara-

\* *Theorie der Versicherung vom wirthschaftlichen Standpunkte*, p. 89 et seq.

† *Vide* Von Boenigk, *Beiträge zum Versicherungswesen vom wirthschaftlichen Standpunkte*, where numerous definitions are quoted.

‡ *Les Questions d'Argent*, pp. 59, 62, 63.

tive (*réparatrice*) insurance by the side of preventive insurance." Von Boenigk \* justly remarks that logically all means are included in this definition which are directed against dangers threatening human possessions, and that under such a conception come pledges and saving. I am not aware that Professor Clark anywhere defines insurance, but his use of the word † shows that he applies it in a general way to the assumption of a risk in the course of the productive process. He speaks of the capitalist as receiving pay for assuming risks which he considers as an insurance premium. The conception of About, which includes lightning-rods among the kinds of insurance (*assurances*), receives by implication the approval of Professor Marshall, who, in speaking of the manufacturer who does not patronize the insurance companies, uses the following language: ‡ "Having decided to run these risks himself, he is likely to spend a little more than his competitors in providing against their occurrence. . . . It [the extra expense] is really an insurance premium in another form. . . . Again, certain insurance companies in America take the risk against fires in factories at very much less than the ordinary rates on condition that certain prescribed precautions be taken, such as providing automatic sprinklers and making walls and floors solid. The expense incurred in these arrangements is really an insurance premium." It is common among writers to speak of gross interest as including compensation for risk; and this is often, if not generally, called insurance.

These quotations show that many of the best authorities use the term "insurance" in a very wide sense. Economists do not confine their use of the term to the business of insurance. What, then, is its true economic signifi-

\* *Beiträge zum Versicherungswesen*, p. 14.

† *Vide* "Insurance and Business Profit," *Quarterly Journal of Economics*, vol. vii. p. 40.

‡ *Principles of Economics* (2d ed.), p. 447.

cance? The writer inclines to the use of the word in its widest sense. It has already passed in economics from its narrower meaning; and the question is, What are the bounds of its proper use? If we are to accept as proper the usage of such authorities as Clark, Marshall, and many others, we must give the word a very wide scope; and there is no stopping-place till we have included under this term all means by which risks are diminished, are shifted from one person to another, or are taken by one or more persons as a part of the process of production. Insurance consists, then, in all those arrangements by which the unfavorable results of the existence of risks are wholly or in part prevented.

The first form of insurance I will call *producers' insurance*. It consists in bearing a risk for the sake of production, and it comes under our definition, because the producer bears a risk which stands between society and the satisfaction of its wants. This leads us directly to the question what effect risk has on distribution. In other words, who are the insurers in the productive process? Are they capitalists or are they entrepreneurs? Or are they both? Are laborers risk-takers? Is the function of risk-taking to have a co-ordinate place in distribution, as suggested \* by Professor T. N. Carver?

Mr. F. B. Hawley,† in a criticism of Boehm-Bawerk, has advocated the theory that the entrepreneur's function is that of the risk-taker, and that profit, his reward, is the pay for risk-taking, or "enterprise." The question whether or not the entrepreneur is a risk-taker depends on the conception of an entrepreneur. Mr. Hawley's idea is that he is a man in active business affairs who is responsible for the capital he is using, or is the owner of it himself. That the entrepreneur is a risk-taker cannot,

\* In a foot-note on his article, "The Place of Abstinence in the Theory of Interest," *Quarterly Journal of Economics*, vol. viii. p. 58.

† *Quarterly Journal of Economics*, vol. vi. p. 280 *et seq.*

I think, be questioned if we take the view Mr. Hawley holds, and, indeed, the view generally held, of the nature of the entrepreneur. But is the entrepreneur the *only* risk-taker? To be consistent, this view must include among entrepreneurs all lenders of money who receive anything above the minimum of interest. It is universally agreed that gross interest contains a loading which is due to the risk encountered by the lender. If, then, Mr. Hawley is logical, the man who loans his funds to hazardous enterprises is an entrepreneur. This view has something to commend it, as it leaves the capitalist, as the receiver of net interest, the reward for the employment of capital when used in the safest possible channels. But this is not all. We must consider the question whether the laborer can be a risk-taker. Mr. Hawley \* himself, in his controversy with Professor Clark, proves conclusively that other things than capital can be risked. Life and reputation, time and future wages, all can be risked. The man who performs the function designated as labor by economists undergoes risk as well as the possessor of capital. This is too familiar a fact to need proof. It was treated by Adam Smith,† where he said, in speaking of different employments, that “the wages of labor vary according to the probability or improbability of success in them.” This being true, if Mr. Hawley is to be consistent, he must include among entrepreneurs every laborer who is able to exact from society any compensation for assuming a risk. Doubtless such a system might be worked out which would be perfectly logical and consistent with the facts. We might start with the proposition that there are three kinds of cost,—personal exertion, abstinence, or waiting, and risk-taking. No man could be found who suffered any one of these costs in its purity, but it would be a logical carrying out of the idea that

\* *Quarterly Journal of Economics*, vol. vii. p. 470.

† *Wealth of Nations*, Book I. chap. x., Part 1.

distribution must go entirely by functions discharged. Though we might construct such a system as this, it is doubtful whether it would be of any value to our science. The problem of distribution with which economists are struggling is, in large part, the problem of what classification of the facts brings out recognized truths most clearly and in due perspective. It seems to me that the method which would make insurance a co-ordinate subject in distribution would have no special merit in this way.

We now turn to Professor Clark's criticism of Mr. Hawley.\* The whole criticism consists in putting forward Clark's peculiar conception of the entrepreneur.† According to Professor Clark, the reward of risk-taking belongs to the capitalist. The entrepreneur is the co-ordinator of capital and labor, nothing more. His reward is pure profit. Professor Clark says,‡ “We have used the term entrepreneur in an unusually strict sense, to designate the man who co-ordinates capital and labor, without in his own proper capacity furnishing either of them. Yet our eyes are open to the fact that the living man who performs this function *has to do other things also*.§ It is only in the one limited capacity that we have called that of the entrepreneur, that the man is confined to co-ordinating the elements furnished by others. . . . In performing this one function, he contributes to industry nothing but relations. He connects labor and capital with each other in his own establishment. He connects this establishment with

\* Vide *Quarterly Journal of Economics*, vol. vii. p. 40 *et seq.*

† It may be well to state here that I accept Clark's treatment of land which makes it one form of capital, and with him should not give rent a co-ordinate place in distribution. “Ground rent is not to be determined by the relation of land to all other agents, but it is to be found by determining (1) the relation of labor to all capital, (2) the relation of land to other forms of capital.” (Lectures by Professor Clark at Johns Hopkins University, 1893.) This will explain the fact that I shall not again refer to rent in this paper. It would be easy, if necessary, to show that the land-owner is a risk-taker.

‡ *Quarterly Journal of Economics*, vol. vii. pp. 45, 46.

§ Italics are mine.

others, and makes it do its part in the general industrial system. He becomes the owner of the products of this industry, as they are turned out, and sells them in the market for what he can get. In acquiring this ownership, he must pay all the costs entailed in creating the product. And among the costs to be thus defrayed is the entire sum made over to the capitalist as an offset for risk." Professor Clark excludes from the function of the entrepreneur every activity which can possibly be classed as labor, and, moreover, the entrepreneur possesses "no dollar."\* Accepting Professor Clark's conception of the entrepreneur, the result follows that he is not a risk-taker; for he has nothing to risk. It is admitted that no single example of the pure entrepreneur can be found anywhere. This fact seems to me a serious indictment of the conception.

We are not satisfied with the above conception of the entrepreneur. It seems that it would be better to understand the phrase "co-ordinator of capital and labor" (which is a very happy expression) in a wider sense. The entrepreneur is a co-ordinator in no passive way as merely furnishing a relation, but he is a person of activity. He *makes* the relations. He must first be a laborer himself. Then he must have a capital of his own, unless he can get the use of capital as a gift from some relative or friend. *Because* he is both a laborer and a capitalist, he is able to co-ordinate labor and capital. The typical entrepreneur is the most active of men. Watchfulness, care, responsibility, are his. His capital and his reputation are constantly at stake. The only check upon his risks is his own vigilance. Men of this description are a great fact in modern industry. Concrete examples of them are to be seen anywhere and everywhere. Why not, then, in our scheme of distribution follow out the great characteristics which are patent to all, and do our best to reconcile minor matters to this scheme?

\* Lectures at Johns Hopkins University, 1892.

It is not the purpose of this paper to discuss distribution, but it is obviously necessary to outline as briefly as possible a distributive system before going further in the discussion of our subject. The essentials of production are two,—labor and capital. The man whose distinguishing function in the productive process is personal effort is a laborer, whether he carries a hod or is President of the United States. The man who possesses wealth which is used productively is a capitalist. If he co-ordinates his capital with his own labor or that of others, he is an entrepreneur. He is a special kind of laborer. All laborers are co-ordinators of capital and labor; but the entrepreneur is distinguished from other laborers by the fact that his own capital (or capital borrowed on his credit, which amounts to the same thing) is co-ordinated with labor, while the simple laborer brings nothing but his personal qualities to the productive process.

Interest is the reward for the use of capital; and its rate in any case is gauged by, or, at least, must be equal to, the subjective valuation of those disutilities essential to the production and use of the last increment of capital actually employed in production. This rate is equal to the marginal productivity of capital. This agrees, so far as the element of risk is concerned, with Professor Carver, when he says: \* “Abstinence is not the only sacrifice involved in the lending or the employment of capital. At present there is always more or less risk involved. Marginal productivity must be sufficient to compensate for both risk and marginal abstinence, for both are combined in the sacrifice of the capitalist class. For the present, therefore, we make no distinction between the interest paid and the surplus arising from the employment of the last increment of capital.”

In the same way wages is the reward paid for keep-

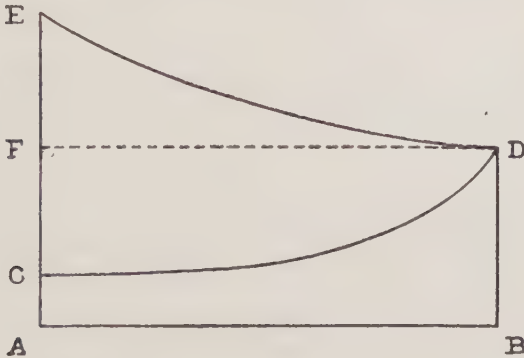
\* “The Place of Abstinence in the Theory of Interest,” *Quarterly Journal of Economics*, vol. viii. p. 55.

ing a man's personal exertions productively employed, and must be measured by the subjective valuation placed by the worker on the various disutilities involved in performance of the last increment of labor essential to the productive process. One of these disutilities is unquestionably in many cases the subjection to risks to life and health.

Professor Carver, in the article to which reference has been made, has shown that interest is equal to the reward for marginal abstinence, with risk added. The greater the amount which must be saved, *ceteris paribus*, the higher becomes the margin and the greater becomes the interest. The risk he considers a constant quantity, and so represents it in his diagram, because, he says,\* "risk does not necessarily increase as saving advances." Now, it is true that it does not necessarily increase. Indeed, it may decrease. As men get more capital, they may be willing to risk a part at least of it for a less reward. One man may put a high subjective valuation on abstinence or waiting and a low valuation on risk, while another may consider abstinence of small importance and risk a great hardship. But just as it is true that interest must compensate for abstinence or waiting at the rate of the highest estimate placed upon it by any of those lenders whose capital is actually used, so it is true that it must compensate for a given amount of risk at the rate of the highest estimate placed upon the assumption of risk by any of those capitalists whose funds are employed subject to the given risk. For the sake of examining the compensation for risk-taking, let us suppose there is absolutely no charge for abstinence or waiting, so that the only compensation the capitalist requires is pay for risk-taking. If but a small amount of capital must be secured, it can be obtained from those who put a low estimate on risk, but, as more is required, enough compensation must be given to cover higher estimates of risk.

\* *Quarterly Journal of Economics*, vol. viii. p. 57.

On the accompanying diagram let the increments of capital employed in all kinds of business where the risk is the same mathematically be measured along the line A B, and the increasing subjective aversion to assuming additional risks be represented by the distance between A B and the curve C D. If money were needed, only in moderate quantities, it could be obtained by offering



a small compensation for risk; but, as lenders are asked to risk more and more of their money, and money for those kinds of business is more and more borrowed from men whose subjective estimate of risk is high, the compensation must be increased. At the same time the productivity of successive increments of capital will decrease. This is represented by the distance of the line A B from the curve E D. If there be free competition in the loan market, all lenders will be able to demand the same compensation for risk-taking as those whose subjective valuation is the highest. The risks taken would constantly increase until it was found that it did not pay to take greater risks; that is, until the reward for risk-taking should equal the productivity of capital. Then total interest, which by our hypothesis is total reward for risk-taking, will be represented by the rectangle A B D F.

Such would be the condition if risk alone were paid for, and a similar condition would exist if abstinence or waiting were paid for by itself. But, as a matter of fact, interest is paid for waiting and risk taken together. Each lender makes a subjective estimate of the *total* disutility of loaning his funds. Interest is determined by the marginal sum of these disutilities. It is not the lender whose estimate of abstinence is highest nor whose estimate of risk is highest, but the lender whose estimate of the sum of these disutilities taken together is highest, who is the marginal lender, and determines the rate of interest.

If we reject altogether the theory which makes interest the reward for the sacrifice involved in abstinence or waiting, and with Boehm-Bawerk consider interest as the premium which present goods command over future ones of like kind and quantity, we can still consider risk as a factor in fixing the rate of interest, for it gives an additional reason for esteeming present goods more than future goods. Boehm-Bawerk himself gives the uncertainty of life as one of the causes for the higher estimation placed on present than on future goods.\*

It is not necessary to dwell upon the subject of wages. It is sufficient to remark that, just as the marginal lender is he whose estimate of the sum of the disutilities of lending is highest, so the marginal laborer is the laborer whose estimate of the sum of the disutilities incident to labor is highest, and not necessarily the laborer whose estimate of the pain of labor nor whose estimate of the risk of labor is highest.

The question arises, What is profit? Without going into an extended discussion of the matter, we may say that it is the reward that comes to the entrepreneur on account of the special advantage which he has to use his talents and employ his capital from the fact that he is

\* *Positive Theory of Capital* (Smart's translation), Book V. chap. iii. p. 255 *et seq.*

both a laborer and a capitalist. If we can find out what his income would be if he loaned his capital to others, and also sold his services to others in such a way as to run the same risk and perform the same amount of labor as he does as an entrepreneur, the difference between this income and the total income which he receives as an entrepreneur represents the reward that comes to him from the fact of his double function, and may be called profit.

What has already been said implies the negative answer to the question which was raised, whether risk should have a co-ordinate place in the distributive scheme. Professor Carver, in a foot-note to the above-mentioned article of his, expresses the hope that the progress of economic science will soon make it necessary to deal with the question of risk under the separate heading of insurance. "Of the traditional four channels of distribution, wages would undoubtedly have first impressed itself upon the mind of an economist. Such simple tools as the primitive workman used would scarcely have been regarded as of sufficient importance to call for a distinct treatment. The theory of interest therefore would have developed later than that of wages. Rent and profits followed each in turn. Insurance will probably soon take its place as a fifth channel of distribution." Another and, it seems to me, a better way of looking at the matter is that implied, if not expressly stated, by Cairnes, who includes \* "that low degree of risk inevitably attaching to such act" as an element in "abstinence," and who in analyzing labor as a cost finds † that its total disutility is measured by, first, duration; second, irksomeness; third, "risk or liability to injury of any kind attending it." That the assumption of risks receives a reward is beyond question, but it is not clear that this reward can be separated from the

\* *Leading Principles of Political Economy*, p. 80.

† *Ibid.*, pp. 79 and 80.

rewards of capital and labor. We never find, unless we are to accept Mr. Hawley's view of the entrepreneur, risk-taking as a function in the productive process except as it is an integral part of the function either of the laborer or the capitalist.

The existence of insurance companies and of vast speculating operations might seem to show that cases exist where risk-taking is the essence of a productive function. When we discuss the economic nature of the insurance business, we shall show that this is emphatically what sound insurance companies do *not* do. Let us look at the other case, that of speculation. We may admit that it is productive in the economic sense. If so, is its essence risk-taking? Speculation which is anything more than mere gambling or fraudulent manipulation of values (neither of which can be called productive) is based on the most painstaking and careful forecast of market conditions. Such activity is to be classed with the function of the entrepreneur or the laborer. Even in speculation, though risk is more prominent perhaps than anywhere else in the industrial system, we find success bound up with hard work and keen judgment. Moreover, the speculator must be the possessor of capital, and there is much force in the contention of Professor Clark that the only person who can risk capital is the capitalist.\* The phenomenon of speculation, then, can be brought into the general scheme of distribution with no difficulty without assigning to risk-taking a separate heading.

We have already seen that the assumption of risks must be recompensed. We will now examine the psychological forces which determine this compensation. What I shall say on this subject will follow essentially the views of Professors Mangoldt† and Clark,‡ who have admi-

\* "Insurance and Business Profit," *Quarterly Journal of Economics*, vol. vii, p. 40.

† *Unternehmensgewinn*, p. 80 *et seq.*

‡ *Quarterly Journal of Economics*, vol. vii, p. 40 *et seq.*

rably stated the leading principles. Professor Newcomb,\* speaking of the part of interest which represents reward for risk-taking, says, "Since he himself [the lender] is the sole judge of the risk and the compensation, no sure mathematical law can be laid down to govern the case." While this statement is true, as Professor Newcomb himself shows, we may find some general principles which help us to get at the manner in which the measurement is made.

The amount of probable gain must equal the amount of possible loss, not in the mere objective amount as represented by market values, but according to the subjective valuation of the person who is about to risk his capital or other valuable thing. Mangoldt remarks that among a poor people we see that undertakings which bring in far more to the fortunate than the losses of the unfortunate do not call forth great competition. On the other hand, there are many classes of undertakings where the gains of the fortunate do not equal the losses of the unfortunate. Statistics are said to show that over 90 per cent. of those who go into business become bankrupts. Too much stress may easily be put upon this fact, but it indicates the great extent to which men go into business when the real probability of loss exceeds the probability of gain. In all higher callings the losses are probably greater than they are estimated. Multitudes of young men flock into the law and other such callings. We know from experience that gains may be above as well as below what they should be on the basis of objective facts.

"The loss of a cow to one who is dependent upon it," says Mangoldt, "would cause greater pain than the gain of an equal objective value could possibly compensate for." A man of large resources cannot be charged with improvidence if he plays in a lottery where the probability

\* *Political Economy*, p. 310.

of gain is always smaller than the probability of loss, whatever we might say of the ethical aspect of the case. One would be foolish to stake *his all* on a gambling operation, even if the probability of gain were far greater than the probability of loss. Mangoldt gives these formulas to explain the case.\* If we suppose that the probability of gain, objectively considered, equals the probability of loss, and that a risk would be taken under those circumstances; if  $C$  = cost of the undertaking,  $U$  = number of undertakings of the kind in question,  $S$  = the number of successful undertakings,—then the amount of gain expected in order to induce the taking of the risk would be represented by the expression  $\frac{CU}{S}$ .

Now let  $P$  = subjective pleasure of profit, and  $D$  = subjective disutility or pain of loss, the amount to be received will be  $\frac{DCU}{PS}$ , which amount may be either above or below  $\frac{CU}{S}$ , according as  $D$  is greater or less than  $P$ . The amount must be higher, the more one feels the pain of loss or fails to appreciate the pleasure of gain and the reverse. It will be higher when large sums are risked than when small sums are risked, higher with a poor than with a rich people. It will be higher with a stationary people than with a progressive people. Where a people is in a primitive state and necessities only are produced, there is no room for effective risks, and insurance cannot play any considerable part in distribution. As a people makes progress, it will be more inclined to take risks, even if the gain be small. National as well as individual temperament has a great modifying influence on the disposition to take risks. Tastes also do much to influence risk-taking. A man may go into a dangerous business because it has characteristics which attract him to such an extent that they entirely overcome any disinclination on account of the attendant risk. The people of a nation may be too ready to assume risks. If they

\* *Unternehmergewinn*, p. 90.

habitually take risks which exceed the objective probability of gain, it is a disadvantage to the national resources. That the people of the United States do this is not unlikely. Edwin Cannan\* thus expresses his opinion of England: "It is probable that in this country, on the whole, we suffer more from the sanguine than from the too cautious temperament, from too much than too little 'enterprise.'"

The relation of the subjective estimate of risks to the corporate organization of industry is of great importance.† John Stuart Mill ‡ gave some attention to joint stock companies, and reached the conclusion that, when any other method was available, it was to be preferred to the joint stock method. Modern experience contradicts his dictum. One reason for the attractiveness of the joint stock principle is found in the fact that, as a man's capital increases, the successive increments thereof have a diminished valuation. He will risk a few increments of wealth near the margin for a small compensation, because a loss there would be of slight consequence to him. Where a man engages in business on his own account, his entire estate is liable for all debts of the business; but, under the joint stock principle, only the capital put into the business is ordinarily liable for the debts of the business. This enables the capitalist to place his marginal wealth in jeopardy; and this action, if not carried too far, is socially desirable. The objective risk to the capitalist is diminished, and his subjective estimate of it still more decreased. This tends to lessen the necessary compensation for risk-taking, and consequently to diminish the gross share of the product which goes to risk-takers.

We have spoken hitherto for the most part as if capital

\* *Economic Review*, vol. iii. p. 460.

† This is stated admirably by Professor Clark in his article on "Insurance and Business Profit," *Quarterly Journal of Economics*, vol. vii. p. 40.

‡ *Political Economy*, Book I. chap. ix., Part 2.

were the only thing risked. It is natural to do this, because the most superficial observation shows that, as a general thing, much more is charged for risking capital than for taking the risks of labor. "Capital" is proverbially "timid"; and the larger part of it, by a process of natural selection, has come to be in the hands of those who are relatively prudent. Every man in modern industry is the disposer of his own labor, and the majority of men are neither wise nor prudent. Indeed, it seems almost as if the risk taken by the laborer might be disregarded; but this cannot be done theoretically, and in practice such risks doubtless have some weight. If all men were of equal ability and equally adapted to all kinds of business, such is the rashness of a large portion of the human race that laborers could be found for almost any business without giving very much for risk-taking. But, when society wants a man of highly developed intellectuality for a dangerous post, he will be likely to have a just appreciation of the risk, and will require compensation, not only for his skill, but for incurring danger.

Yet the risks incurred by labor deserve our notice. They may be divided into two classes, which I will call preparatory and contemporaneous. Many kinds of laborers can pursue their callings only after a tedious, lengthy, and often expensive training. When a young man enters upon such a course of training, he risks his time, his money, and his effort. These risks are preparatory risks. The best examples of this kind of risks are found in the learned professions. In the law, for instance, a minority are said to succeed in securing a livelihood. Not only is this true, but those who do earn their living from the profession do not get, extraordinary as lawyers' fees sometimes seem, enough to balance what the others lose. In the words of Adam Smith,\* "The lottery of the law is very far from being a perfectly fair

\* *Wealth of Nations*, Book I. chap. x., Part 1.

lottery." Notwithstanding this fact, professions of this class are full. Smith accounts for this in part by "the natural confidence which every man has, more or less, not only in his own abilities, but in his own good fortune" (*i.e.*, he is unduly inclined to take risks). No modern writer has stated this fact more truly or more felicitously. Another fact which bears upon the subject of preparatory risk is stated by the same author in this way: "The contempt of risk and presumptuous hope of success are in no period more active than at the age at which young people choose their professions." The excitement actually or apparently attendant upon certain kinds of labor is a powerful factor in overcoming the natural influence of risk. From these facts it happens that preparatory risks do not have so powerful an effect as we might perhaps expect, yet there can be no doubt that multitudes are prevented from entering the learned professions by their influence.

We come to contemporaneous risks, such as are undergone in certain mechanical processes. Some kinds of work must be carried on in great heat, others where dust of a dangerous kind fills the atmosphere. The writer is informed by a credible witness that workmen in powder-mills have a very easy time, and that the pay is high.

Some of these risks which I have classed as laborers' risks are capable of classification among the risks to capitalists. If one ventures capital in attempting to fit himself for a profession or trade in which his chances of success are small, it may be said that it is as a capitalist that he takes the risk. If we follow the nomenclature of Smith,\* and speak of the productive qualities of men as a form of capital, of course all risks can be called capitalists' risks; but such a classification would logically obliterate all distinction between wages and interest. So long as we treat labor force as a different thing from capi-

\* *Wealth of Nations*, Book II. chap. i.

tal, and consider men as anything more than mere machines, there is a class of risks which cannot possibly be classed as risks to capital. With these it has seemed best to me to class the risks of capital which are taken with the view of modifying by education or otherwise characteristics and abilities of the laborer.

The second main division of insurance I have called *preventive*, a term which I have borrowed from About. All means for the elimination of risks, whether those means are intended to completely destroy the risk which would otherwise exist or are designed to perfectly eliminate it, are here included. This class embraces all those means which Herrmann denominates prevention and suppression. When discussing the word "insurance," I defended the use of the word which includes these means. It remains to mention some of the subdivisions of this department of the subject: (a) Mechanical insurance, such as lightning-rods, safety-valves, fire-extinguishers, fire-engines, the duplex check used by conductors. The list might be indefinitely extended. (b) Providential insurance, the intelligent foresight which looks forward to possible dangers, and avoids them. Whatever strengthens man's intelligence adds to the effectiveness of this means. Inspection of various kinds comes under this head, and is sometimes combined with the business of insurance, as in the Hartford Steam Boiler Inspection and Insurance Company,—in this case with most favorable results. (c) Ethical insurance, the restraints which morals place upon men so far as they make economic prosperity possible. The labors of teachers and preachers can be placed here by the economist. (d) Legal insurance. Much of the action of government through police, courts, fire departments, etc., might be put here. These instances are only typical, and the list makes no pretence of being complete.

The third great division of insurance is *compensatory* insurance. The fundamental characteristic of this kind

of insurance is the transferring of the burden of a loss to a place where it will be less severely felt or making good the loss in whole or in part. This kind of insurance is in a sense a rival of the preceding. Herrmann in his *Theorie der Versicherung* \* discusses the respective spheres (*Kreise*) of "prevention," "suppression," and insurance (using the word in the same sense that I later use the expression "technical insurance"). Each one has its own place of greatest usefulness; and all these should work together and supplement each other,—a fact which Wagner seizes upon as an argument for state control of insurance, saying that, as the state has control, for the most part, of the first and second, it ought to control the other also, in order that all means of resisting harm may be co-ordinated in the best way. Herrmann's treatment of the subject, though I prefer a different classification, seems very satisfactory. It amounts to this: that preventive insurance should be employed just so far as it is cheaper than compensatory insurance, and no further. If the cost of making buildings fire-proof is greater than the cost incident to a larger destruction by fire than would occur with the more expensive structures, it is desirable that buildings burn and their owners be compensated. There is a maximum desirable preventive insurance and a maximum desirable compensatory insurance. Both are attained when the last dollar spent for preventive insurance yields the same advantage as the last dollar spent for providing for compensation in case of loss.

While these varieties of insurance are competitors in some fields, it is evident that neither can take the place of the other. Some risks, were preventive insurance removed, would become so great that compensatory insurance could not cope with them. Experience in Germany shows that hail insurance is more or less successful in neighborhoods where the danger is small, but that hail

\* Page 89 *et seq.*

insurance companies rarely succeed where the average of danger is great. On the other hand, however perfect preventive insurance is made, it will fail to give complete security.

The first kind of compensatory insurance is self-insurance. The principle of this is the same as the principle which we have referred to as helping to make the corporate form of industrial organization attractive and popular. A man insures himself against a loss which will give him great subjective pain by providing a fund out of which he can replace that which has a high subjective valuation by substituting what before had a lower subjective valuation. Saving is the best example of this. The prudent laborer sees to it that he has an account at the savings-bank. This insures him against want. Suppose that he falls sick. His ordinary income falls off, and he draws upon his account to supply those commodities which have a high subjective utility. Where is the shifting of the burden in this case? It consists in this: that the money saved and put in the bank was taken from the last and, therefore, least useful increments of his former earnings, and these increments are now made to step into the place of the first and most useful increments of the wages which he would have earned if sickness had not intervened. Every increase of a man's wealth insures him more and more against losses entailing great pain. It is conceivable that in a highly rational society the motive of insurance might suffice to secure adequate capitalization, even if there were no interest on capital.

Another form of self-insurance is that in which one can, because of the extent of his possessions, dispense with the services of insurance companies. A man known to the writer never has an insurance policy on his houses, which are both numerous and scattered. It is cheaper for him to bear all losses falling upon his property than to pay the premiums of insurance companies. The reason

he can do this is of course that the management of insurance companies is expensive. If it cost nothing to manage a company, it would be a matter almost of indifference to this man whether he was insured by a company or not. The fact that the wealthy man can insure himself more cheaply than the insurance companies gives him an advantage in the competition of producers, and enables him to gain the difference between the cost of carrying his risks himself and the cost of having the insurance companies carry them. This opportunity for extra gain by the large producer is one of the advantages of production on a large scale; and the gain itself is a part of those gains aptly designated by Mangoldt\* as the "rent of the large producer" (*Grossunternehmerrente*). Of course, production on a large scale has disadvantages as well as advantages; but this is not the place for discussing them.

We now come to what I have designated technical insurance, or what is generally understood by the insurance business. Many writers would allow the name of insurance to this kind only. Wagner, who is the chief German authority on the subject, thus defines insurance:† "Insurance in the economic sense is that economic arrangement which removes or at least diminishes, so far as the means (*Vermögen*) of a person are concerned, the injurious consequences of single events which are accidental to the person affected, and, therefore, in the single cases of their entrance unforeseen, in such a way that it distributes these [injurious consequences] upon a series of cases in which a similar danger (*die gleiche Gefahr*) threatens, but does not (at least not now or not yet) actually enter." This definition has the merit of calling attention to the true economic nature of the operation of the insurance business, which is the distribution of

\* *Unternehmergewinn*, p. 136.

† In Schönberg's *Handbuch der politischen Oekonomie*, p. 942.

the loss wholly or in part upon others who were at the beginning of the insurance period subject to the same risk. I would define technical insurance as that arrangement by which persons subject to a risk agree directly or indirectly with each other that those who escape the threatening event will make up to those who suffer by it the whole or a part of the loss. The motive for doing this arises from the fact that the subjective estimates of the risks are greater than the actual chance of injury. The arrangement may be made by the simple agreement between the parties insured without the prepayment of any premium and an assessment be levied when any occasion therefor arises. A more complex form of mutual insurance company may be used or a stock company may come in as an intermediary. In all cases the economic essence of the operation is the same as in the simplest form.

In order to carry this form of insurance on successfully, a rather complex organization is usually necessary. Advance premiums have in practice been found indispensable to all kinds of safe insurance. If premiums are not paid in advance, many of the economic circle entering into the arrangement will be either unable or unwilling to pay as they have agreed. If premiums are to be paid in advance, some experimental knowledge of the probable loss is necessary. In the case of many kinds of risks reliable statistics are entirely wanting, and in some classes of risks entirely impossible.

If our explanation of the true economic nature of technical insurance be the correct one, it is evident that a stock company organized for the purpose of insuring against risks is a risk-taker in an entirely different sense from that in which risks are usually taken. It takes the risk from the insured, but it does not take an equally hazardous position itself. Insurance men know from statistics approximately how many losses they will have

to meet. What to the insured was an uncertainty or risk becomes a practical certainty. The men who invest their money in an insurance company supply the necessary machinery by which the loss is distributed on those subject at the outset to the same risk. It is for these reasons that I think that the insurance business does not furnish any basis for giving insurance or the assumption of risks a separate share in distribution.

The main purpose of technical insurance is to relieve the individual of the burden of risk resting upon him. Aside, however, from the direct effect of technical insurance, there are certain subsidiary effects upon the social organism. Some of these effects are good, and some are unfavorable. Let us consider the good effects: (*a*) The decrease of the cost of production. Under the head of producer's insurance we saw that risk to the individual producer was a subjective cost, and that marginal subjective estimates of risk enter in as a determinant of objective cost. Now, technical insurance comes in, and removes the major part of this item of cost. The producer, in place of carrying a risk that is burdensome to him, pays a premium which is relatively light. Nowhere is this more true than in the case of marine insurance. Imagine that marine insurance did not exist. The shipping business would be carried on only by great companies possessing many ships, so that they could get the benefit of self-insurance. It needs no argument to prove that the price of foreign merchandise would be much higher than now. Fire insurance is another excellent example of this fact. This brings us directly to the next advantage of technical insurance, which is a corollary of what has just been said. (*b*) It makes it possible for small producers to hold their own, where otherwise they would be forced out of business. (*c*) Technical insurance prevents the impairment of the productive force of society by putting productive agents back into their old positions after a disaster.

President Walker \* shows how labor may become permanently degraded as the result of temporary misfortune. Suppose a village whose chief support is a single industrial establishment. Suppose this establishment burned, with no insurance. The employer cannot readily transfer himself to another place where his talents can be used so advantageously, and the same is true of the laborers. Both become discouraged, and the industrial efficiency of master and man may be forever impaired. Insurance guards against this calamity. Fire insurance, accident insurance, and insurance against sickness are efficient in the same way. Life insurance in a more direct way accomplishes the same result by keeping families together, and allowing the orphan children to be brought up with proper training, all of which results ultimately in increased productivity. (d) Technical insurance is an aid to credit. The practice is universal of requiring houses, or other inflammable property on which money is raised by mortgage, to be insured. Without insurance, many who now borrow freely from savings-banks and other lenders would be unable to borrow at all, and others would borrow only at ruinous rates. (e) Life insurance combines what I have called self-insurance of the nature of saving with technical insurance. A form of life insurance which does not do this is conceivable, and has sometimes been tried; but the common form lays aside a reserve fund against the claim of each person insured. This form of insurance, therefore, encourages capitalization. This, to be sure, is not a net gain, because a man who is insured, feeling a sense of security, is likely to spend that part of his income which is left after paying his insurance premium more freely than would be the case if he were not insured. But, as premiums are generally paid out of income, we may conclude with Schönberg † that "there is generally a stronger building up of private

\* *Wages Question*, chap. iv.

† *Volkswirtschaftslehre*, p. 798.

capital than would otherwise follow." (f) The sociological and ethical effects which result from the security and comfort which insurance gives are influences for good.

The good effects above enumerated are not without some offsetting disadvantages. Security is good, but security as well as hazard may have an unfavorable effect upon industry. (a) Intensity of effort is diminished. Make the ordinary man's future secure even on a low material basis, and his energy will flag to some extent. (b) Carelessness is encouraged by insurance. Much wealth, for instance, goes up in smoke simply because vigilance is relaxed on account of the property being insured. (c) The greatest disadvantage of technical insurance is the encouragement which it gives to dishonesty. Property is wilfully destroyed to get insurance, thus increasing the net amount of property destroyed and increasing the cost of insurance to honest men. I have been informed that where a mill burns in a factory village the village hotel is almost sure to follow. The same informant states that a prudent insurance man of his acquaintance makes it a rule, on learning of the burning of a mill in a village, to cancel all insurance held by him on the hotel. It is estimated\* that from 35 to 50 per cent. of the loss by fire in the United States is chargeable to incendiarism.

This evil is largely aggravated by the willingness of agents to place insurance for as large sums as possible for the sake of commissions. If any method could be devised by which the amount of insurance could be restricted to the economic value of the property insured, this kind of social loss would for the most part be abolished. There would still remain the moral hazard of excessive estimates of loss where there was no dishonesty in the origin of the fire. Is there any way in which society can protect itself against the waste by incendiary fires? The

\*Thomson, "Waste by Fire," *Forum* (September, 1886), vol. ii. p. 27 *et seq.*

only effective means would be some method of getting the face of the policy down to the economic value of the property, or, better still, somewhat below the economic value. Insurance ought never to remove the entire burden of risk from an owner. Probably the so-called valued policy laws of some States, which make a company pay the face of the policy in every case of total destruction, were designed to force the companies to investigate and restrict themselves to the true value in writing the policy. If so, the attempt has so far been a failure.

Technical insurance is attended with a large expense for management, and, at present, this is excessive. Not that insurance men make greater gains than other business men, but there are more agents for all kinds of insurance companies than there is economic justification for. This is true of a great many other kinds of business. But insurance furnishes one of the best examples of the tremendous wastes of the competitive system, which the socialists urge with such force and truth. Wagner\* rightly makes it one of his chief arguments in favor of state insurance.

The question how wide a sphere can be occupied by the insurance business deserves our attention. The conditions which are desirable and to some extent essential to the successful application of the principle of technical insurance to risks are set forth by Wagner,† and what I shall say on this subject will follow his treatment. The first condition is that the harmful event must be for the person affected an accident. It must either be an event which he cannot bring about or which, under ordinary circumstances, it is against his interest to bring about. This condition is perfectly realized in the case of hail

\* "Der Staat und das Versicherungswesen," *Zeitschrift für die gesamte Staatswissenschaft*, vol. xxxvii. p. 102.

† Schönberg, *Handbuch der politischen Oekonomie*, chap. xxv. pp. 948-950.

insurance. In all forms of life insurance it is with slight exception secured; but in fire, marine, and live stock insurance it is far from being fully realized, though the condition is in most of these cases so far realized that such forms of insurance are of the greatest advantage. The second condition is that the cause of the injury must be to a large extent controllable and recognizable with certainty, and the kind and extent of the economic results consequent upon an injury ascertainable and measurable. The great danger of simulation in sick insurance makes that form of insurance very unsatisfactory, and will probably prevent its success on any large scale, though it may have a very useful field when carried on in connection with lodges or by friendly societies whose members know each other sufficiently to guard against an excess of this evil. In hail, fire, marine, and live stock insurance it has been found difficult to determine the extent of the economic injury. The third condition is that the event against which the insurance is placed ought to be of such a character that it should not be likely to occur in all possible cases or in a very great number of cases at the same time. Its probable occurrence should be distributed in time and locality. All good insurance companies guard against too great localization of their risks. The difficulty of realizing this condition has made hail insurance of little value, and has rendered impossible insurance against the damages of floods, earthquakes, insect pests, etc. For the same reason insurance against losses from commercial and industrial depressions are also impracticable. The fourth, and perhaps the most important, condition is that the probability of loss be experimentally ascertainable. Here statistics have great significance. By statistics, according to the so-called law of large numbers, empirical laws are discovered. Losses can by statistical investigation be assigned to their causes, and the influence of different conditions on losses be approxi-

mately determined. There is much hope for progress in this direction.

The principle of technical insurance has been applied with success in insurance against dangers of the sea, accidents, boiler explosions, lightning, and death. It has also been applied to land titles, and companies for the insurance of honesty in persons who are placed in positions of trust are having a deserved success. In these cases there can be no doubt that the advantages of insurance far outweigh all disadvantages. In Germany hail insurance and stock insurance have been tried with some success. In both these cases there are difficulties which make it doubtful whether they will ever be widely employed. Statistics of sufficient accuracy are wanting, and the opportunities for fraud are great. Still, this kind of insurance may have a useful field. Insurance against sickness, mortgage insurance, the insurance of rents and interest, and insurance against depreciation of commercial paper or stocks and bonds are possible but more doubtful forms.

Leaving now the question of technical insurance, let us return in conclusion to the general aspect of the subject, and ask ourselves what is the effect of economic progress upon risk and insurance. In the early part of this paper the distinction was drawn between effective and ineffective risks. This marginal line which may be conceived of at any given time as fixed changes with dynamic changes in society. All progress which makes government more effective, knowledge more diffused, and ethical conduct more general, tends to lower this margin by making security more fully attainable. This change also makes possible the production with some risk (it may be a large risk) of things which were previously not to be produced at all either on account of their certain or almost certain destruction, if produced, or on account of the lack of the means for producing them. The effect

of this lowering is to increase the field of effective risks. Risks previously below the margin now enter in as costs. As society advances and reason dominates more and more, certain risks will be assumed with far more caution than at present. Reference has already been made to the ease with which laborers are found for dangerous employments. Many of the motives which lead men into such employments are irrational. If a more correct conception of the extent of risk and a more just estimate of the worth of human life become diffused, the subjective estimate of risks will increase, especially among laborers. But the greatest increase in the importance of risks may be expected in the multiplication of those risks which we have called dynamic. As society advances and changes with constantly accelerating rapidity, as there is every reason to expect it will, the amount of dynamic risk promises to become appalling. Even now it is said that methods change so rapidly that a man who builds a large machine shop must, before a stroke of work is done there, remove some of his machinery and replace it with later patterns. All these influences tend to make the reward of the risk-takers a constantly enlarging fraction of the total income of society.

While progress in all these ways tends to increase the importance of risks, it also eliminates or diminishes risks in other ways. Ethical progress removes more and more moral hazard. Science vastly reduces many forms of danger. Government regulation removes others. Perhaps we can say that, objectively considered, static risks tend to diminish with progress, but the subjective estimate of risks in general and the number and magnitude of dynamic risks will tend to increase, so that the importance of risks in economic life may be expected to increase rather than diminish.





